FOLIA TAXONOMICA 17. *DILKEA* (PASSIFLORACEAE) 2. CONSPECTUS OF THE SPECIES OF THE GUIANAS WITH THREE NEW SPECIES

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ABSTRACT

The conspectus lists six species of *Dilkea* (Passifloraceae) from the Guianas including three new species. Two new species of *Dilkea* subgenus *Dilkea* are described from the Guianas: **D. clarkei** from Guyana and **D. granvillei** from French Guiana; and one in subgenus *Epkia*, **D. exilis** from Amapá, Amazonas and Pará (Brazil) and French Guiana. A key to the Guianan species of *Dilkea* is provided.

RÉSUMÉ

Le conspectus liste six espèces de *Dilkea* (Passifloraceae) des Guyanes, y compris trois espèces nouvelles. Deux dans le sous-genre *Dilkea* sont décrites des Guyanes: **D. clarkei** de Guyana et **D. granvillei** de Guyane ; et une dans le sous-genre *Epkia*, **D. exilis** de l'Amapá, de l'Amazonas et du Pará (Brésil) et de Guyane. Une clé des espèces guyanaises de *Dilkea* est présentée.

The genus *Dilkea* Mast. can be separated easily from the other three genera of Passifloraceae from the western hemisphere. It has tetramerous flowers, versus pentamerous in *Passiflora* L. an androgynophore null to shorter than the ovary, versus well developed longer than the ovary in *Ancistrothyrsus* Harms, and 1 style with 4 branches 1/3 to 1/2 from base, versus 4 free styles in *Mitostemma* Mast. (Feuillet & MacDougal 2007). An introduction to *Dilkea* and a key to the subgenera can be found in Feuillet (2009).

In the text below, the word "lacking" means "not present in the taxon" and the expression "not seen" means "not present in the collections studies." In the descriptions, morphology and measurements between parentheses pertain to organs still growing.

A. Subgenus *Dilkea*

The species of *Dilkea* subg. *Dilkea* are sometimes low shrubs or treelets or mostly shrubs becoming lianas, climbing with tendrils that are trifid at apex. If the tendrils do not find a support, they are early deciduous, but otherwise become rigid and similar to twigs with respect to their diameter. The grabbing segment rolled around the support is usually swollen. In contrast with species of subg. *Epkia* Feuillet, those of subg. *Dilkea* have branches with internodes gradually increasing in length from the branching point, and their leaves are more or less regularly spaced, although rarely two are sub-opposite.

Subgenus *Dilkea* includes all the species described previous to 2009, but (see Feuillet 2009) not *D. johannesii* var. *parvifolia* Hoehne. Killip (1938) placed *D. ulei* Harms in the synonymy of *D. johannesii* Barb. Rodr. and everybody since then agreed with him. Although he suggested the genus might be monotypic, Killip kept four separate species—*D. acuminata* Mast. from Amazonas (Brazil), *D. johannesii* from Amazonas and Pará (Brazil), *D. retusa* Mast. from Amazonas (Brazil) and Loreto (Peru), that he selected as the type of the genus, and *D. wallisii* Mast. from Pará (Brazil, Loreto (Peru), and Amazonas (Venezuela) – and added one of his own, *D. parviflora* Killip from Loreto (Peru). Since then, the taxonomic history of *Dilkea* has been a series of various regroupings and a couple of new species. In 1968, *D. magnifica* Steyerm. was described. Holm-Nielsen et al. (1988) recognized *D. johannesii*, *D. parviflora*, and *D. retusa* (including *D. acuminata*, *D. magnifica*, and *D. wallisii*). In 1991, Cervi described *D. margaritae* from Mato Grosso (Brazil) and compared it to *D. acuminata* and *D. johannesii*. Tillett (2003) recognized as good species *D. acuminata* (including *D. johannesii* var. *parvifolia*, *D. magnifica*, and *D. parviflora*), and *D. retusa* differing by flower aestivation, but did

not mention *D. johannesii* var. *johannesii*, *D. margaritae*, or *D. wallisii*. Tillett also stated that *Dilkea* included 7–9 species, implying that 2–4 species were undescribed. I am adopting a position rather close to Tillett's conclusions. The real problem is to deal with the numerous modern collections, especially from western Amazonia, which will be the subject of a latter paper.

1. Dilkea clarkei Feuillet, sp. nov. (**Fig. 1**). TYPE: GUYANA. UPPER TAKUTU–UPPER ESSEQUIBO: Kamoa Mts., 1°32'N, 58° 50'W, 520 m, 9 Nov 1996, fr, *H.D. Clarke 2987* (HOLOTYPE: US; ISOTYPES: BRG, CAY, K, MO, NY, P, VEN).

Haec ad subgenero *Dilkea* pertinens. A aliis speciebus, foliis coriaceis, ellipticis, 5–11 cm longis, fructibus sub-sphaericis, 2–3.5 cm, non apiculatis differt.

Liana climbing with thick, glabrous, axillary tendrils trifid at apex. Stems terete, glabrous, branches with short internodes and scales at basal 2–4 cm. Bud scales narrow-triangular, 5 × 1 mm, swollen at the very base, glabrous. Stipules reduced to U-shaped, shortly crenate-serrate rim around the base of the petiole, open apically, glabrous. Leaves alternate, occasionally subopposite; petiole canaliculate, 1–2.5 cm long, swollen at the base, glabrous; lamina coriaceous, elliptic, 5–11 × 4–7.5 cm cuneate at base, acuminate at apex, entire at margin, undulate when dry (probably due to the flattening of the leaf in the press), glabrous, 7–10 main veins on each side of the midrib. Inflorescences of solitary flowers at the axils of the first leaves of young stems. Flowers not seen. Fruits orange, globose, 2–3.5 cm diam., without basal and apical cones, with short to very short trichomes; seeds few, 15 × 10 × 7 mm, ovoid, slightly asymmetric, not to the point of having a flat or concave side, tapering at base, pedicel ca. 3 mm long.

Distribution and ecology.—Dilkea clarkei is known by two collections from the Upper Takutu–Upper Essequibo region of Guyana, at 250–520 m in forest on slope or summital scrub forest.

In subg. *Dilkea*, *D. clarkei* is unlike any other species because of the following characters. It has smaller, coriaceous, elliptic leaf blades and globose fruits that are neither tapering at base, nor hard apiculate.

Etymology.—Dilkea clarkei has been named in honor of H.D. Clarke, botanist (Univ. North Carolina at Asheville), an untiring collector of the Flora of Guyana who made the two collections of this new species known to me.

PARATYPES: **GUYANA. Upper Takutu–Upper Essequibo:** Makawatta Massif, westernmost part, 3°5'24"N, 59°26'43"W, 250 m, 31 May 1996, fr., *H.D. Clarke 1848* (CAY, US).

2. Dilkea granvillei Feuillet, sp. nov. (**Fig. 2**). TYPE: FRENCH GUIANA: Sommet des Monts Galbao, 10 km SE of Saül, 650 m, 9 Mar 1975, fr., *J.-J. de Granville 2398* (HOLOTYPE: CAY (2 sheets)).

Haec ad subgenero *Dilkea* pertinens. A aliis speciebus, foliis chartaceis, oblanceolatis, (5–)13–18 cm longis, fructibus ellipsoideis vel obovoideis, 8 × 4 × 4 cm differt.

Woody climber; stems glabrous, axillary tendrils trifid at apex. Stems terete, glabrous, branches with short internodes and scales at basal 2–4 cm. Bud scales narrow-triangular, 5 × 1 mm, swollen at the very base, glabrous. Stipules fused in a U-shaped, shortly crenate-serrate rim around the base of the petiole, open apically, glabrous. Leaves alternate, sometimes subopposite; petiole canaliculate, (0.7–)2–2.5 cm long, glabrous, pulvinus less than a third of the total length; lamina chartaceous, (elliptic to) oblanceolate, (5–)13–18 × (3–)5.5–8 cm, (obtuse to) cuneate at base, rounded and with a 1–2 cm long acumen at apex, entire at margin, undulate when dry (probably due to the flattening of the leaf in the press), glabrous, 10–14 main veins on each side of the midrib. Inflorescences of solitary flowers in the leaf axils. Flowers not seen. Fruits pendent, orange with green spots, ellipsoidal to obovoid, 8 × 4 cm, shortly tapering at base, with a hardened apical cone, glabrous; seeds 10–15, 15 × 10 × 7 mm, ovoid, slightly asymmetric but not to the point of having a flat or concave side, tapering at base.

Distribution.—Dilkea granvillei is known only from the type locality on top of Mounts Galbao, near Saül, central French Guiana. It was fruiting in March and, according to the label of *de Granville 2398*, the seeds were germinating in the fruit.

In subg. *Dilkea*, *Dilkea granvillei* is unlike any other species because of the following characters. It has chartaceous, oblanceolate leaf blades and ellipsoid to obovoid fruits tapering at base and hard apiculate.

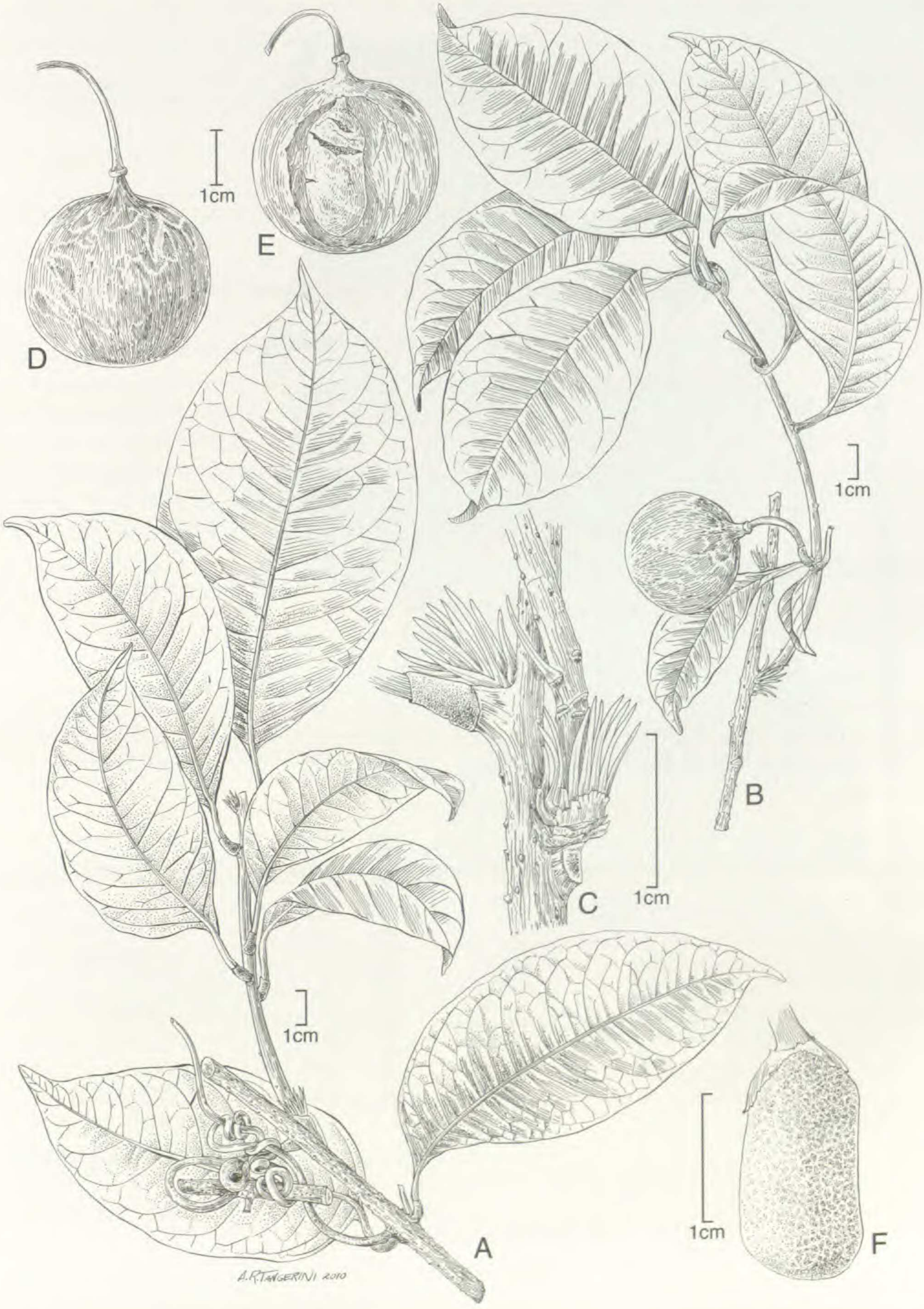

FIG. 1. *Dilkea clarkei*. **A.** Stem with leaves and tendrils; **B.** Stem with leaves and a fruit; **C.** Nodes showing the base of a branch and numerous bud scales; **D.** Fruit; **E.** Fruit open showing one of the seeds in the aril sac; **F.** Seed with only the base of the aril sac. A from *H.D. Clarke 1848* (US); B–F from type *H.D. Clarke 2987* (B, E–F: US; C–D: MO).

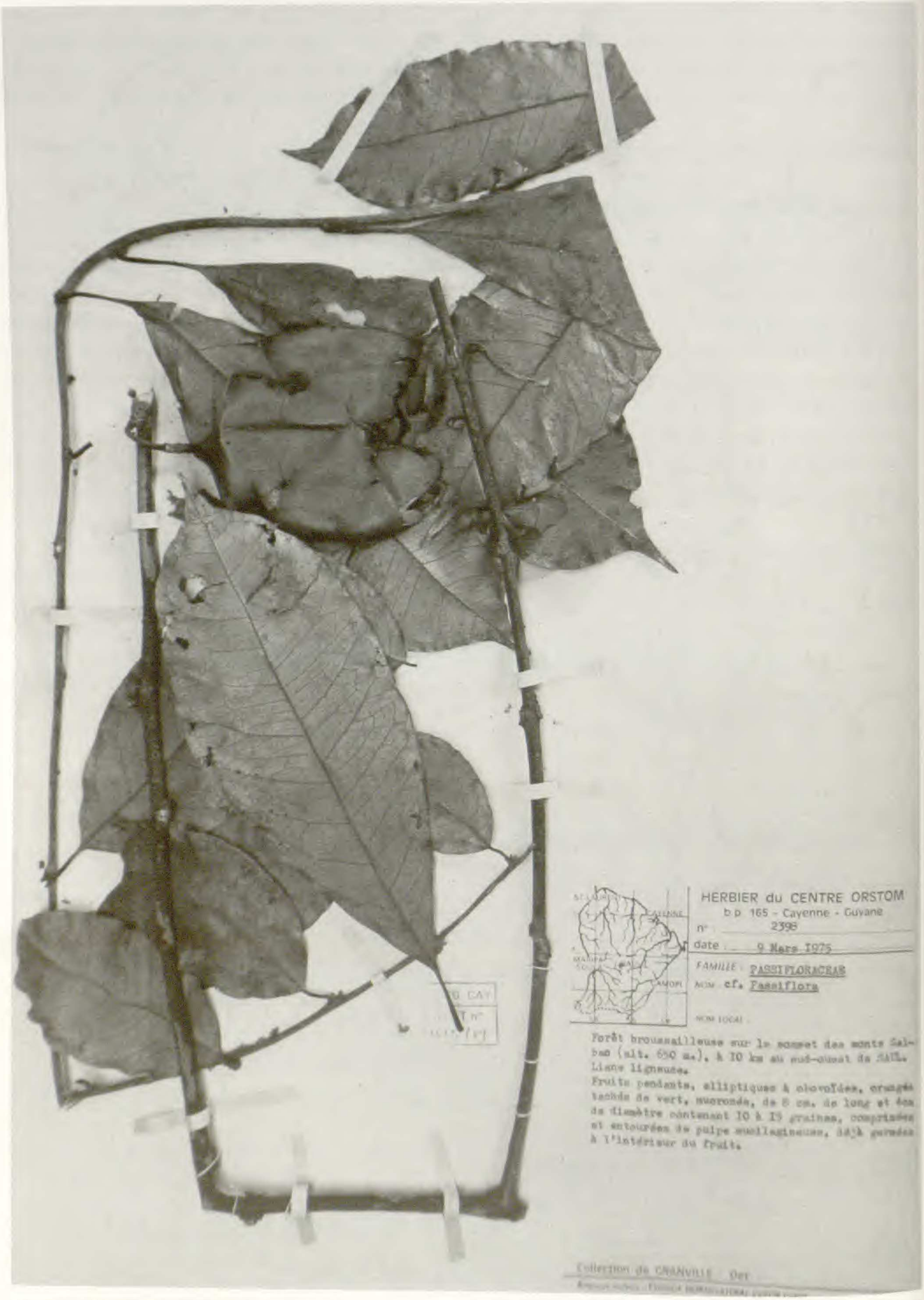

FIG. 2. *Dilkea granvillei*, holotype *de Granville 2398* (CAY)

Etymology.—The epithet honors my friend and colleague, Jean-Jacques de Granville, former head of the botany department in Cayenne (CAY), French Guiana.

3. Dilkea retusa Mast., Trans. Linn. Soc. London 27:628. 1871. TYPE: BRAZIL. AMAZONAS: Manaus, Mar 1851, fl., *R. Spruce 1320*[5] (HOLOTYPE: K; photo BM, P, US).

?= *Dilkea acuminata* Mast., Trans. Linn. Soc. London 27:628. 1871. TYPE: BRAZIL. AMAZONAS: Manaus, Mar 1851, fl., *R. Spruce 1320*[3] (HOLOTYPE: K).

= *Dilkea wallisii* Mast, in Mart., Fl. Bras. 13(1):622; pl. 103, f. 3. 1872. TYPE: the cited illustration, drawn from a painting by Wallis (Brazil).

= *Dilkea magnifica* Steyerm, Acta Bot. Ven. 3:186. 1968. TYPE: VENEZUELA. DELTA AMACURO: Sierra Imataca, Cerro La Paloma, E side of Río Cuyubini, 100–200 m, 18 Nov 1960, fl, *J.A. Steyermark 87606* (HOLOTYPE: NY).

?= *Dilkea parviflora* Killip, Publ. Field Mus. Nat. Hist., Bot. Ser. 19:575. 1938. TYPE: PERU. LORETO: Mishuyacu, near Iquitos, 100 m, 2 Apr 1930, fl, *G. Klug 1158* (HOLOTYPE: US; ISOTYPES: F, NY).

Distribution.—From northern Amazonia and French Guiana and Venezuela to Bolivian Amazonia.

I am placing *D. parviflora* in the synonymy of *D. retusa*, along with *D. wallisii*, because the shape of the leaves on the type specimen from Peru is intermediary between the type of the other two, both from near Manaus (Brazil), but with some reluctance because the flowers of the type of *D. parviflora* are smaller. I am also hesitant to place *D. acuminata* in this synonymy because of the main veins are said by Killip (1938) to be much less ascending than Masters' illustration in *Flora Brasiliensis* (1871). If that were confirmed, *D. acuminata* could be a separate species or the correct name for *D. johannesii* and *D. ulei*.

Specimens examined: **BOLIVIA. Beni:** 2 km NW of Guayaramerin, 19 Feb 1978, fl, *W.R. Anderson 12120* (INPA). **BRAZIL. Amazonas:** Munic. Itapiranga, Rio Uatumã, 27 Aug 1979, fl, *C.A. Cid, W.R. Buck, B.W. Nelson, F. Almeida, C.D.A. Mota & J. Lima 861* (INPA); Road Manaus – Boa Vista, 60°08'W, 02°27'N, 150 m, 27 Feb 1976, fl, *P. Bamps 5447* (BR); **Pará:** Belem, 3 Apr 1926, fl, *A. Ducke* s.n. (BR-21307); **Rondônia:** Rodovia Presidente Médici-Alvorada, Rio Muqui, 18 Jun 1983, fr., *M.G. Silva 6218* (MG, US). **COLOMBIA. Valle:** Munic. Buenaventura, 76°58'W, 04°02'N, 30–50 m, 18 May 1989, fr, *D.C. Daly, R. Callejas & M. Monsalve 6036* (NY, US); **Vaupés:** Río Inírida, Raudal Guacamayo, 69°45'W, 4 Feb 1953, fr, *A. Fernández 2124* (COL, US). **FRENCH GUIANA:** Approuague River, about 4.5 km upstream from Pierrette, 9 Jun 1966, fr, *R.A.A. Oldeman B-541* (CAY); Arataye River, Inselberg des Nouragues, 52°42'W, 4°03'N, 30 Oct 1993, fl., *Poncy 937* (CAY, P, U, US); Arataye River, Montagne des Nouragues, 52°42'W, 4°3'N, 260 m, 2 Apr. 1992, fl. Bud & fr., *Larpin 1028* (CAY); Counami, 53°15'W, 05°21'N, 22 Mar 2000, fl, *J.-F. Molino & D. Sabatier 1979* (CAY, P, US); Massif du Décou-Décou, near Citron, 580 m, 13 Nov 1982, fl., *C. Feuillet 368* (BR, CAY, P, U, US); Montagne des Nouragues, 52°42'W, 04°03'N, Feb 1990, fl, *D. Larpin 861* (CAY(2), US); Montagnes de la Trinité, N summit, 400 m, 12 Jan 1984, fl., *de Granville et al. 5908* (CAY); Near Saül, between Eaux Claires and St. Éloi, 53°12'W, 03°37'N, ca. 250 m, 18 Sep 1994 fl, *S.A. Mori, C. Snyder & R. Fowler 23957* (NY, US); Route de l'Est (RN 2), Montagne Maripa, 10 May 1979, fl, *J.-J. de Granville 2884* (CAY, US). **PERU. Loreto:** Gamitanococha, Río Mazán, 100–125 m, 12 Feb 1935, fl, *J.M. Schunke 233* (P, US). **VENEZUELA. Amazonas:** Río Negro, San Carlos, about 100 m, 28–29 Jan 1930, fl, *E.G. Holt & W. Gehriger 292* (US); **Bolívar:** Río Asa, Raudal Maturin, 63°19'W, 06°22'N, 13 May–13 Jun 1987, bud & fr, *B. Stergios 11218* (PORT, US).

B. Subgenus *Epkia*

For an introduction to *Dilkea* subg. *Epkia* see Feuillet (2009).

4. Dilkea exilis Feuillet, sp. nov. (**Fig. 3**). TYPE: BRAZIL. AMAPÁ: Serra de Navio, Igarapé Pedra Preta, 22 Nov 1954, fr., *R.S. Cowan 38505* (HOLOTYPE: NY).

Haec ad subgenero *Epkia* pertinens. Petiolus parte non-tumida 0.8–2.4 cm longa, lamina foliorum membranacea vel chartacea, 14–30 × 3.7–9 cm, cuneata differt.

Shrubs or small trees 1.5–8 m tall. Whole plant glabrous. Stems with a long internode 3–9 cm long, followed by short ones about as long as once their diameter or less. Bud scales linear about 2 mm long. Tendrils lacking. Stipules not seen. Leaves mostly in terminal clusters; petiole (1.5–)2–3.2 cm long, including the pulvinus 0.7–1.6 cm long, glands not seen; blade narrow oblanceolate, cuneate, (14–)17–30 × (3.7–)5–9 cm, long attenuate, apex acute, acuminate, margin entire, drying dark olive adaxially and yellowish olive abaxially, midrib and veins raised on both surfaces and yellowish when dry, 10–15 main veins on each side of the midrib. Inflorescences subterminal; pedicels 6–14 mm long under the fruits. Flowers not seen; gynophore 2–4 mm long under the fruit. Fruits spherical, apex conical, 5 cm diam., yellow to pale yellow, pericarp coriaceous, about 0.5 mm thick; seeds the shape of peanuts, 14 × 6 mm.

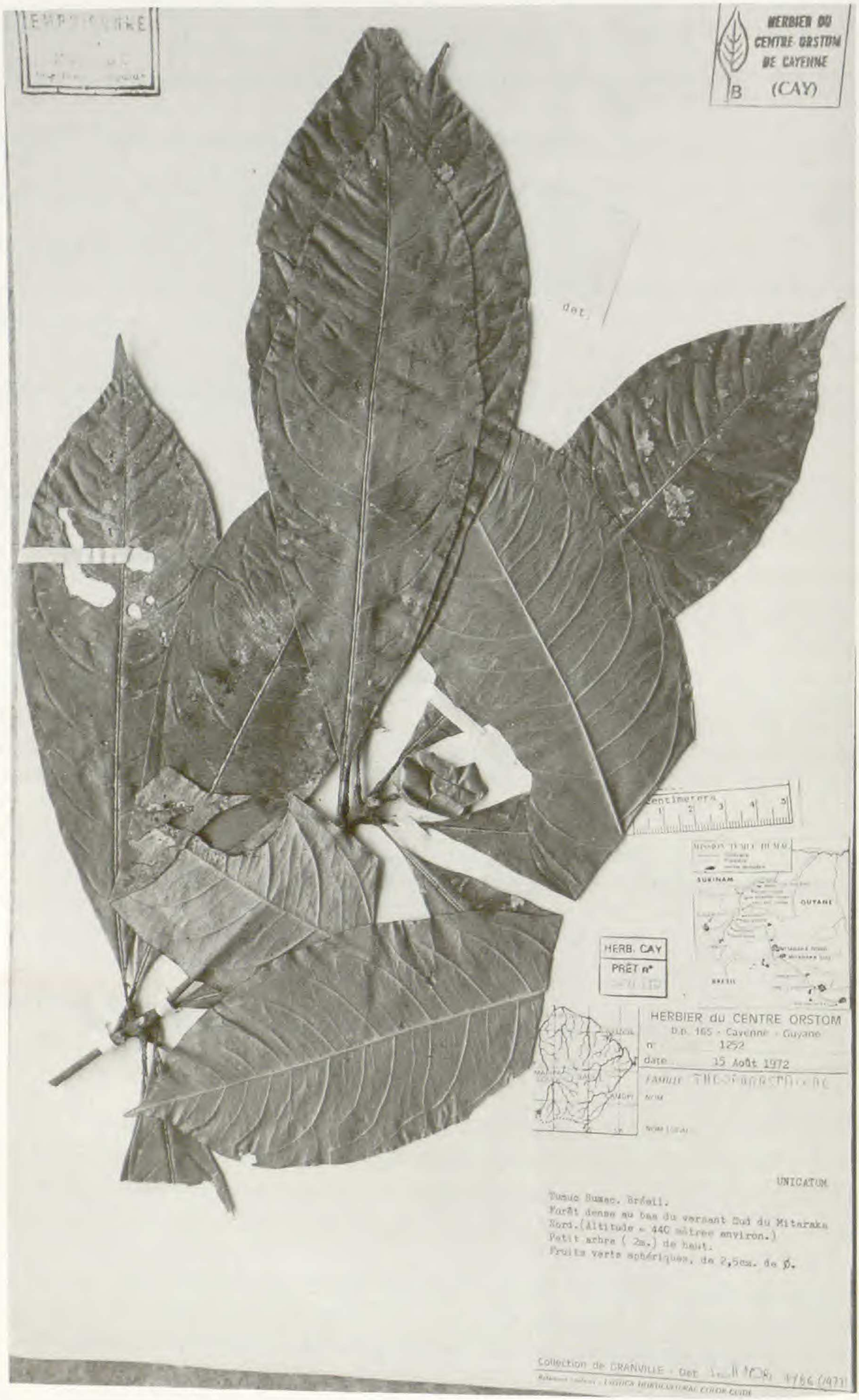

FIG. 3. *Dilkea exilis*, paratype *de Granville 1252* (CAY)

Distribution.—*Dilkea exilis* is known from northern and western Amazonia from the Oyapock River, the border between French Guiana and Amapá (Brazil), to Pará and Amazonas (Brazil).

Dilkea exilis can be recognized easily from other species of subg. *Epkia* by the combination of the following characters. Its leaves have petioles up to 3 cm long with a short pulvinus and blades with a thin texture, and fruits spherical, not tapering at base, but with a hard conical apex.

Etymology.—The specific adjective *exilis*, meaning thin in Latin, refers to the leaf blades of that species that are membranaceous on dried herbarium specimens.

PARATYPES. **BRAZIL. Amapá:** Oyapock River, Brazilian bank, between Oiapoque and Clevelandia, 19 Jul 1960, fr, *B. Maguire, J.M. Pires & C.K. Maguire 47077* (MO, NY n.v.); S slope of Mt Mitaraka North, 440 m, 15 Aug 1972, fr, *J.-J. de Granville 1252* (CAY, CAY); **Amazonas:** BR 230, Rod. Transamazônica, 303 km from Humaitá, Munic. Novo Aripuanã, near Rio Aripuanã, 07°35'S, 60°40'W, 27 Apr 1985, fr., *C.A. Cid Ferreira 5850* (INPA n.v., MO, NY n.v.); **Pará:** Munic. Oriximiná, Rio Trombetas, Lago Erepecu, 18 Jul 1980, fr, *C.A. Cid, J. Ramos, C.D.A. Mota & N. Rosas 1673* (INPA n.v., MO). **FRENCH GUIANA:** Arataye River, Saut Pararé, 11 Oct 1980, fr (*fide sched.*), *D. Sabatier 5* (CAY, CAY).

5. Dilkea lecta Feuillet, J. Bot. Res. Inst. Texas 3:597, fig. 2, 25 Nov 2009. TYPE: FRENCH GUIANA: near Organabo, primary forest on white-sand, 20 Jun 1995, fr., *D. Loubry 2422* (HOLOTYPE: US; ISOTYPES: CAY, MPU).

=? *Dilkea johannesii* var. *parvifolia* Hoehne, Comm. Linh. Tel. Matto Grosso ao Amazonas, Annexo 5, Bot. pt. 5:73; pl. 111. 1915. TYPE: BRAZIL. MATO GROSSO: Rio Juruena, *Comm. Linh. Tel. Matto Grosso Expedition 5433* (SP).

Distribution.—*Dilkea lecta* is known from the Lely Mountains in eastern Surinam, from central and northwestern French Guiana, and from Mato Grosso (Brazil).

6. Dilkea vanessae Feuillet, J. Bot. Res. Inst. Texas 3:602, fig. 5, 25 Nov 2009. TYPE: FRENCH GUIANA. Pic Matecho, camp near the summit, 500 m, 14–15 Dec 2000, fr., *V. Hequet 1000* (HOLOTYPE: US; ISOTYPE: CAY).

Distribution.—The only known collections were made in the rainforest, on Pic Matecho and Montagne des Nouragues, granitic outcrops in central French Guiana. They were fruiting in November and December.

KEY TO THE SPECIES OF *DILKEA* IN THE GUIANAS

1. Main stem growth continuous, leaves scattered along the branches ____ **subg. Dilkea**
   2. Leaf blades membranous or chartaceous ____ **D. granvillei**
   2. Leaf blades coriaceous.
      3. Leaf blades elliptic, 5–11 × 4–7.5 cm ____ **D. clarkei**
      3. Leaf blades elliptic to obovate or oblanceolate, 15–28 × (5–)7–14 cm ____ **D. retusa**
1. Main stem growth rhythmic, branches' growth units with a long internode and the leaves aggregated at the apex ____ **subg. Epkia**
   4. Petioles reduced to its swollen curved base or nearly so; leaf blades narrow-oblanceolate, 9–14.5 × 1.7–3.5 cm ____ **D. lecta**
   4. Petioles with a straight thin portion clearly visible above its swollen curved base.
      5. Leaf blades coriaceous, with 7–9 main veins each side of the midrib ____ **D. vanessae**
      5. Leaf blades membranous to chartaceous, with 10–15 main veins each side of the midrib ____ **D. exilis**

ACKNOWLEDGMENTS

I would like to thank Paul Hiepko (B) and Shawn Krosnick (RSA) for their reviews of this paper. This work could not have been completed without the help of the curators of the herbaria AAU, CAY, MO, NY, and P who hosted me in their institution or made available to me the material in their care. This is number 164 in the Smithsonian's Biological Diversity of the Guiana Shield Program publication series.

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